

Wireman Control Panel

(Job Role)

Qualification Pack: Ref. Id. ELE/Q7302

Sector: Electronics

Textbook for Class XI

विद्यया ऽ मृतमश्नुते



एन सी ई आर टी
NCERT

राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्
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Foreword

The National Curriculum Framework–2005 (NCF–2005) recommends bringing work and education into the domain of the curricular, infusing it in all areas of learning while giving it an identity of its own at relevant stages. It explains that work transforms knowledge into experience and generates important personal and social values such as self-reliance, creativity and cooperation. Through work one learns to find one's place in the society. It is an educational activity with an inherent potential for inclusion. Therefore, an experience of involvement in productive work in an educational setting will make one appreciate the worth of social life and what is valued and appreciated in society. Work involves interaction with material or other people (mostly both), thus creating a deeper comprehension and increased practical knowledge of natural substances and social relationships.

Through work and education, school knowledge can be easily linked to learners' life outside the school. This also makes a departure from the legacy of bookish learning and bridges the gap between the school, home, community and the workplace. The NCF–2005 also emphasises on Vocational Education and Training (VET) for all those children who wish to acquire additional skills and/or seek livelihood through vocational education after either discontinuing or completing their school education. VET is expected to provide a 'preferred and dignified' choice rather than a terminal or 'last-resort' option.

As a follow-up of this, NCERT has attempted to infuse work across the subject areas and also contributed in the development of the National Skill Qualification Framework (NSQF) for the country, which was notified on 27 December 2013. It is a quality assurance framework that organises all qualifications according to levels of knowledge, skills and attitude. These levels, graded from one to ten, are defined in terms of learning outcomes, which the learner must possess regardless of whether they are obtained through formal, non-formal or informal learning. The NSQF sets common principles and guidelines for a nationally recognised qualification system covering Schools, Vocational Education and Training Institutions, Technical Education Institutions, Colleges and Universities.

It is under this backdrop that Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE), Bhopal, a constituent of NCERT has developed learning outcomes based modular curricula for the vocational subjects from Classes IX to XII. This has been developed under the

Centrally Sponsored Scheme of Vocationalisation of Secondary and Higher Secondary Education of the Ministry of Human Resource Development.

This textbook takes care of generic skills embedded in various job roles in a comprehensive manner and also provides more opportunities and scope for students to engage with these common and necessary skills, such as communication, critical thinking and decision making in different situations pertaining to different job roles.

I acknowledge the contribution of the development team, reviewers and all the institutions and organisations, which have supported in the development of this textbook.

NCERT would welcome suggestions from students, teachers and parents, which would help us to further improve the quality of the material in subsequent editions.

New Delhi
June 2018

HRUSHIKESH SENAPATY
Director

National Council of Educational
Research and Training

About the Textbook

India is one of the largest growing consumer electronics markets in the Asia-Pacific Region. The electronics sector produces electronic equipment for industries and consumer electronics products, such as mobile devices, television sets and circuit boards. Industries within electronics include telecommunications, equipment, electronic components, industrial and consumer electronics.

The growth of the electronics sector has accelerated due to increased consumer spent around the world. As developing economies grow, consumers' demand for electronic products also increase. Countries that produce electronics now have a strong consumer base that can afford new electronic products. Increased competition is driving down the costs associated with electronics production and expanding the availability of affordable electronic products.

A Wireman — Control Panel reads the wiring diagram and routes, and wires various components within the panel in accordance with the diagram. The person is responsible for wiring all components present within the panel as per specifications provided by the design engineering team. The person must have the ability to work in high decibel noise environment and in standing position for long hours.

The textbook for the job role of 'Wireman — Control Panel' has been developed to impart knowledge and skills through hands-on learning experience, which forms a part of experiential learning. Experiential learning focusses on the learning process of an individual. Therefore, the learning activities are student-centered rather than teacher-centered. The textbook has been developed with the contribution of expertise from subject and industry experts and academicians, making it a useful and inspiring teaching-learning resource material for students. Care has been taken to align the content of the textbook with the National Occupational Standards (NOSs) for the job role so that the students acquire necessary knowledge and skills as per the performance criteria mentioned in the respective NOSs of the Qualification Pack (QP).

The textbook has been reviewed by experts so as to make sure that the content is not only aligned with the NOSs but is also of high quality.

The NOSs for the job role of Wireman — Control Panel covered through this textbook are as follows.

1. ELE/N7302: Wiring control panel
2. ELE/N9962: Interacting with co-workers
3. ELE/N9963: Maintaining safe work surroundings

Unit 1 explains the basic building blocks of electrical and electronics. It explains how electricity is formed and energy is transformed from one form to another. The concept of conductors and insulators has been explained in this Unit. Besides, static and dynamic electricity have been explained. The basic electrical circuit and circuit components have also been dealt with in this Unit. The concept of open and closed circuit, series and parallel connection has also been illustrated. The Ohm's law has been explained and verified through practical experiment. The Kirchoff's current and voltage law has also been verified through practical experiment. Unit 2 discusses several important basic electrical components that are commonly found in circuits. These components are the fundamental building blocks of electrical and electronic circuits, and can be found in large numbers in a control panel, printed circuit board, etc. This Unit provides a basis for recognising and understanding the fundamentals of circuit schematics.

Unit 3 helps identify the values of resistors and capacitor, which are the fundamental components of electrical and electronics industry. Unit 4 explains the concept and importance of electrical earthing system, various types of earthing and methods to do earthing. Unit 5 deals with cabling, process of preparing cables and setting up a connection. Unit 6 discusses workplace health and safety regulations, safety training, and the knowledge and skill to effectively identify and potentially eliminate safety hazards at workplace.

Unit 7 gives an overview of various hand and electrical tools used for the installation of equipment in the control panel, such as screwdriver, phase tester, stripper, plier, etc. Unit 8 explains the assembly of electromechanical devices and the components required for electromechanical assembly. Unit 9 aims to provide knowledge and skill of preparing wire by using appropriate tools. Unit 10 explains the hazards associated with panel assembly and wiring.

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CONTENTS

<i>Foreword</i>		iii
<i>About the Textbook</i>		v
Unit 1	Basics of Electricity and Electronics	1
Unit 2	Electrical and Electronic Components	41
Unit 3	Components Value Identification	73
Unit 4	Electrical Earthing System	84
Unit 5	Cabling	100
Unit 6	Electrical Safety	113
Unit 7	Tools and Equipment	131
Unit 8	Electromechanical Assembly	146
Unit 9	Wire Preparation Methods	158
Unit 10	Hazards with Panel Assembly and Wiring	181
<i>Answer Key</i>		205
<i>Glossary</i>		209
<i>List of Credits</i>		222

Do You Know

According to the 86th Constitutional Amendment Act, 2002, free and compulsory education for all children in 6-14 year age group is now a Fundamental Right under Article 21-A of the Constitution.

**EDUCATION IS NEITHER A
PRIVILEGE NOR FAVOUR BUT A
BASIC HUMAN RIGHT TO
WHICH ALL GIRLS AND WOMEN
ARE ENTITLED**

*Give Girls
Their Chance !*

